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AUTOMATIC STATION "ZOND-7" PHOTOGRAPHS THE  
MOON AND THE EARTH

(TASS)  
PRESS RELEASE &  
PHOTOGRAPHS

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Tass Release and Photographs  
selected from the three news-  
papers "PRAVDA", "KOMSOMOL'SKAYA  
PRAVDA" and the weekly "NEDELYA"  
MOSCOW, 22 August 1969

N.B. The best of all photographs  
published have been selected for  
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As already communicated, one of the scientific experiments conducted in the course of the flight of AIS "ZOND-7" was color photographing of the Earth and the Moon.

The first session of photographing the Earth was completed on 8 August 1969 in the period from 0852 to 0926 hours. At that time the station was at a distance of about 70,000 km from our own planet (see Plate No.1).

Prior to the beginning of the session the station was oriented in such a way that the optical axis of the photocamera installed on board was oriented toward the center of the Earth. At time of photographing the station was above the Caspian sea. On the photograph the axis of the Earth is somewhat deflected toward the left. One may see that no cloud cover existed above that sea and further to the East. One may well perceive the contours of the Republics of Central Asia, of the Aral sea and of the Lake Balkhash. To the East one may see between clouds the Altai mountains, while mountain ranges of Pamir and Tyan' Shan' are clearly outlined. Still further to the East one may see the contours of Lake Baikal.

Behind the overcast concealing the entire Caucasus, one may see the Black and Azov seas and the Crimean Peninsula. To the North beyond the cloud layer, the contours of the Botnik Gulf, of Karelia and White Sea can be perceived. The whole space corresponding to the Arctic Ocean is concealed by clouds.



Fig.1

Photograph of the Earth from a distance of about 70,000 kilometers taken by the automatic interplanetary station "ZOND-7" on 8 August 1969.

Well discernable at the center of the photograph is the Caspian Sea. To the East of it one may see the territory of the Soviet Asiatic Republics. One may also distinguish the northeastern part of Africa and the southeastern Asia

(Tass Photo)



To the South of the Soviet Union one may see the territories of Iran and Afganistan, Irak, Asia Minor and the Arabic Peninsula. In this region attention is drawn by the contours of Mesopotamia with rivers Tigris and Euphrates crossing it.

Beyond the Red Sea one may perceive North Africa and the Nile River over almost its entire flow through Sudan, Egypt and even further through African deserts. There is light cloudiness above the Balkan Peninsula's Mediterranean coast. Heavy clouds, moving from the Atlantic conceal the Pyrenees. At time of photographing the terminator line passed over the Atlantic Ocean.

The second photographing session began on 11 August at 0528 hours Moscow time and lasted ten minutes. At the beginning of the session, the station was at the distance of 10,000 km from the Moon. The left-hand part of the lunar surface is illuminated by the Sun, while the right-hand part is dark. The terminator can well be seen on the photograph (Plate No.2). The western part of Oceanus Procellarum is on the night side (on the color photograph it has a brown-greyish color with some greenish fillings, the color of the remaining regions is grey-yellow).

The major formations of Oceanus Procellarum are clearly outlined: the Struve and Russel cirques. Hercynian mountains round them from the West. To the East of the Eddington cirque, at the terminator, one may see the walls of Seleucus crater, illuminated by rays of the setting Sun. To the North of Eddington cirque, side by side with terminator, there is the Briggs crater and to the South there are two clearly outlined craters: Kraft and Kardan.

In the Southern part of the photograph one can visualize with difficulty the walls of Cavalieri and Hevel cirques illuminated by the setting Sun. The vast bottom of Grimaldi cirque can be seen in lower right-hand corner, and to the northwest of it are located the Godin and Riccioli cirques.

Just about in the middle of the photograph passes from the North to the South the boundary between the visible and far side of the Moon. At the same time the far side is located to the left. In the lowermost part of the photo one may see the Schluter crater and to the right of one may point to the more feebly outlined Hartvig cirque. \*The entire western part of the photograph is filled with numerous families of cirques and craters brightly illuminated by

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\*[Some of crater denominations of the far side of the Moon have been transliterated]





Fig.2. View of the Moon from AIS "ZOND-7" at 10,000 km above the lunar surface taken on 11 August 1969. The numerals denote cirques and craters as follows:  
1) Russel; 2) Struve; 3) Eddington; 4) Briggs; 5) Kardan; 6) Cavalieri; 7) Hevel;  
8) Riccioli; 9) Shluter; 10) Hartvig; 11) Vasco-de-Gama; 12) Einstein; 13) Mosli;  
14) Balboa

(Photo Tass)



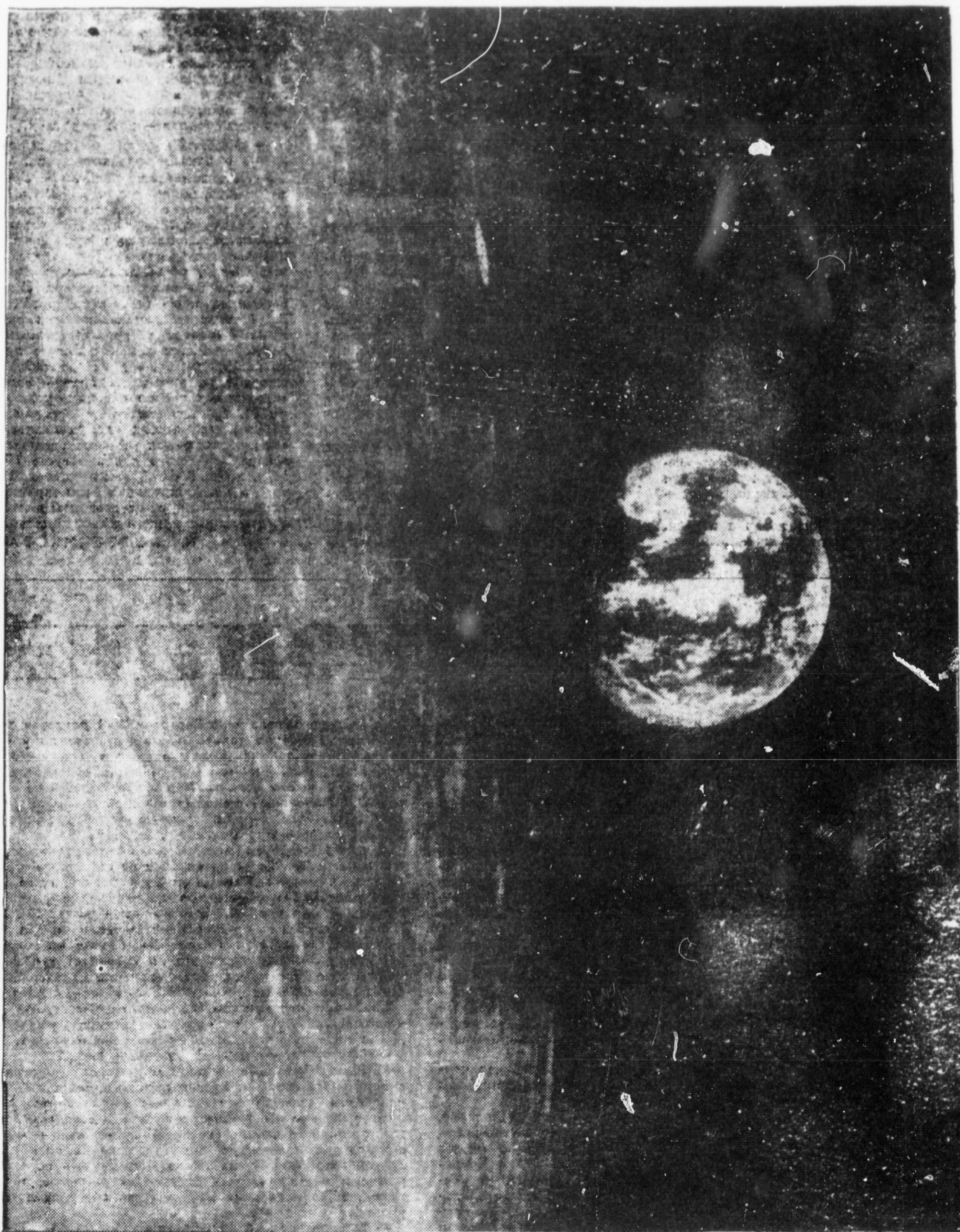


Fig.3. The Earth prior to its setting behind the limb of the Moon. The photograph was obtained on 11 August 1969 by the automatic interplanetary station "ZOND-7". The distance from the station to the Moon is 2000 km. Well discernable in the photograph are Central, Arabian Peninsula and Australia

the Sun. The Vasco-de Gama cirque is noted in the central part of the photo, to the west of which one may see the dual cirque "Einstein" and to the North the Mosli and Balboa cirques. The photograph encompasses  $\sim 30^\circ$  by longitude and  $40^\circ$  by latitude.

The third photographing session began about one hour after the end of the second session, just a few minutes prior to ZOND-7 entering the Moon's radio-penumbra. The orientation and automatic program-control devices assured a high accuracy and reliability of operation of all the units of the cosmic photosystem. In the third session, the optical axis was directed toward the center of the Earth, as in the first session. The photographing of the far side of the Moon was conducted from 2,000 km above the surface of the Moon and lasted to the time of ZOND-7 passing the orbit pericenter (least distance between the station and the Moon).

At the very beginning of the third session color photographs of the Earth were obtained, gradually setting behind the Moon's horizon. Here the Earth is seen in a somewhat different foreshortening (see Plate 3). At the center of the image one may see the southern part of Indus-tan and Northern shores of the Indian Ocean. Hardly concealed by clouds are the Southwestern Asia and Northeastern Africa. Clearly outlined are the Caspian and Aral seas, Central Asia and a narrow band of Africa. In the lower part of the photograph, to the right, contours of Australia appear hardly covered by cloud formations. Part of the photograph is occupied by the Pacific Ocean. The photographing time corresponds to 0708 hours Moscow Time. This is why the western part of Europe and Africa are in darkness. The night-day interface on the photograph is represented by somewhat washed out line, turned toward the Moon.

The results of photographic experiments carried out in the course of the flight of AIS "ZOND-7" are now being processed.\*

( T A S S )

\*\*\*\* T H E E N D \*\*\*\*

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\* [color photographs will be published later in scientific journals]